IN THE CLAIMS:

Please amend claims 1, 3, 5-9, 11-12, 14-18, and 24 as follows.

1. (Currently Amended) A method, comprising:

estimating interference from a received signal at a first observation time, creating a first covariance matrix on ~~the~~ a basis of the ~~estimation~~ estimating and defining an inverse matrix of the first covariance matrix and a Cholesky decomposition matrix;

removing selected covariance components from the Cholesky decomposition matrix;

computing an inverse of a sub-matrix, which represents a common part of the first covariance matrix and a second covariance matrix, which includes covariance estimates of a second observation time, by using ~~the~~ an aid of ~~the~~ a Cholesky decomposition of the inverse matrix of the first covariance matrix;

estimating interference from a received signal at the second observation time and determining additional covariance components on ~~the~~ a basis of the ~~estimation~~ estimating;

creating ~~the~~ a Cholesky decomposition of an inverse matrix of the second covariance matrix by using unitary rotations; and

generating an output value of a channel equalizer by utilizing information obtained with ~~the~~ an aid of the Cholesky decomposition of the inverse matrix of the second covariance matrix.

2. (Previously Presented) The method of claim 1, further comprising filtering additional covariance components.

3. (Currently Amended) The method of claim 1, further defining the Cholesky decomposition of the inverse matrix of the first covariance matrix of ~~the~~ a form

$$\mathbf{W}_p = \begin{pmatrix} \omega_p & \bar{\mathbf{0}}^H \\ \boldsymbol{\omega}_p & \boldsymbol{\Omega}_p \end{pmatrix},$$

where ω_p is a scalar, $\boldsymbol{\omega}_p$ is a vector, $\bar{\mathbf{0}}^H$ is a zero vector and $\boldsymbol{\Omega}_p$ is a lower triangular sub-matrix.

4. (Previously Presented) The method of claim 1, further comprising partitioning the inverse matrix of the first covariance matrix as $\mathbf{U}(n) = \begin{pmatrix} u_p & \mathbf{u}_p^H \\ \mathbf{u}_p & \mathbf{U}_p \end{pmatrix}$,

wherein u_p is a scalar, $\mathbf{u}_p$ is a vector, $\mathbf{u}_p{}^H$ is a complex-conjugate transpose vector, $\mathbf{U}_p$ is a sub-matrix and H is a complex-conjugate transpose matrix.

5. (Currently Amended) The method of claim 1, wherein ~~the~~ a selection of the covariance components to be removed is based on ~~the~~ a size of ~~the~~ a sliding step of a signal window.

6. (Currently Amended) The method of claim 1, further comprising determining

additional covariance components as

$$\begin{pmatrix} \boldsymbol{\sigma}_f \\ \sigma_f \end{pmatrix} = \left(H(n)\left[diag\left(1 - \hat{b}^2(n)\right)\right]H^H(n) + I\delta_0^2\right)\begin{pmatrix} 0 \\ 1 \end{pmatrix},$$

wherein $\boldsymbol{\sigma}_f$ is covariance component vector, σ_f is a covariance component located in ~~the~~ a corner of the second covariance matrix, H(n) is a system matrix in the second observation time ~~of the second covariance matrix~~, diag is a diagonal matrix, $\hat{b}(n)$ is a symbol estimate, H is a complex conjugate matrix, σ_0^2 is ~~the~~ a noise variance, and I is an interference matrix.

7. (Currently Amended) The method of claim 1, further comprising defining ~~the~~ a computation of the inverse of the sub-matrix $\overline{\Sigma}$ representing the common part of the two consecutive covariance matrices with ~~the~~ an aid of determination $\overline{\Sigma}^{-1} = \overline{\boldsymbol{\Omega}}\overline{\boldsymbol{\Omega}}^H$, wherein $\overline{\boldsymbol{\Omega}}$ is a sub-matrix and $\overline{\boldsymbol{\Omega}}^H$ is a complex-conjugate transpose of the sub-matrix.

8. (Currently Amended) The method of claim 1, further comprising defining Cholesky factorisation of the inverse matrix of the second covariance matrix as

$$\mathbf{W}_f = \begin{pmatrix} \overline{\boldsymbol{\Omega}} & -\sqrt{u_f}\,\overline{\boldsymbol{\Omega}}\overline{\boldsymbol{\Omega}}^H \sigma_f \\ \overline{\mathbf{0}}^H & \sqrt{u_f} \end{pmatrix}\Theta,$$

wherein $\overline{\boldsymbol{\Omega}}$ is a sub-matrix, $\overline{\mathbf{0}}^H$ is a zero vector, $\overline{\boldsymbol{\Omega}}^H$ is a complex-conjugate transpose of ~~the~~ a sub-matrix, $u_f = \left(\sigma_f - \boldsymbol{\sigma}_f^H \overline{\Omega\Omega}^H \boldsymbol{\sigma}_f\right)$, σ_f is a covariance component, Θ is

a series of unitary rotations and H is a complex-conjugate transpose matrix.

9. (Currently Amended) The method of claim 1, wherein an output signal of an equalizer is generated as follows:

$$z_k(n) = \beta_k(n)\left(\alpha_k(n)\hat{b}_k(n) + \eta_k^H(n)\mathbf{W}_f^H\tilde{\mathbf{r}}(n)\right)$$

wherein $\alpha_k(n) = \eta_k^H(n)\eta_k(n)$, $\eta_k(n) = \mathbf{W}_f^H\mathbf{h}_k(n)$, $\beta_k(n) = 1 - \dfrac{\alpha_k(n)}{\alpha_k(n) + \left|\hat{b}_k(n)\right|^{-2}}$, $\mathbf{h}_k(n)$ is

a channel response vector, n is an nth symbol, H is a complex-conjugate transpose matrix, $\hat{b}_k(n)$ is a sy mbol estimate based on a channel decoder feedback,

$\mathbf{W}_f = \begin{pmatrix} \overline{\mathbf{\Omega}} & -\sqrt{u_f\overline{\mathbf{\Omega\Omega}}^H\sigma_f} \\ \overline{\mathbf{0}}^H & \sqrt{u_f} \end{pmatrix}\Theta$ wherein $\overline{\mathbf{\Omega}}$ is a sub-matrix, $\overline{\mathbf{0}}^H$ is a zero vector, $\overline{\mathbf{\Omega}}^H$ is a complex-conjugate transpose of ~~the~~ a sub-matrix, $u_f = \left(\sigma_f - \boldsymbol{\sigma}_f^H\overline{\Omega\Omega}^H\boldsymbol{\sigma}_f\right)$, σ_f is a covariance component, Θ is a series of unitary rotations and H is a complex-conjugate transpose matrix, $\tilde{\mathbf{r}}(n) = \mathbf{r}(n) - \mathbf{H}\hat{\mathbf{b}}$ where $\mathbf{H}_k(n)$ is a channel response matrix and n means an nth symbol.

10. (Original) The method of claim 1, wherein the output value of the channel equalizer is generated by further utilizing a-priori symbol estimate information.

11. (Currently Amended) An apparatus, comprising:

a first estimator configured to estimate interference from a received signal at a first observation time, create a first covariance matrix on ~~the~~ a basis of the ~~estimation~~ estimating and define an inverse matrix of the first covariance matrix and a Cholesky decomposition matrix;

a remover configured to remove selected covariance components from the Cholesky decomposition matrix;

a processor configured to compute an inverse of a sub-matrix, which represents a common part of the first covariance matrix and a second covariance matrix, which includes covariance estimates of a second observation time, by using ~~the~~ an aid of ~~the~~ a Cholesky decomposition of the inverse matrix of the first covariance matrix;

a second estimator configured to estimate interference from a received signal at the second observation time and determine additional covariance components on ~~the~~ a basis of the ~~estimation~~ estimating;

a creator configured to create ~~the~~ a Cholesky decomposition of an inverse matrix of the second covariance matrix by using unitary rotations; and

a first generator configured to generate an output value of a channel equalizer by utilizing information obtained with ~~the~~ an aid of the Cholesky decomposition of the inverse matrix of the second covariance matrix.

12. (Currently Amended) The apparatus of claim 11, wherein the Cholesky

decomposition of the inverse matrix of the first covariance matrix is of ~~the~~ a form

$$\mathbf{W}_p = \begin{pmatrix} \omega_p & \bar{\mathbf{o}}^H \\ \boldsymbol{\omega}_p & \boldsymbol{\Omega}_p \end{pmatrix},$$

where ω_p is a scalar, $\boldsymbol{\omega}_p$ is a vector, $\bar{\mathbf{o}}^H$ is a zero vector and $\boldsymbol{\Omega}_p$ is a lower triangular sub-matrix.

13. (Previously Presented) The apparatus of claim 11, wherein the inverse matrix of the first covariance matrix is partitioned as $\mathbf{U}(n) = \begin{pmatrix} u_p & \mathbf{u}_p^H \\ \mathbf{u}_p & \mathbf{U}_p \end{pmatrix}$,

wherein u_p is a scalar, $\mathbf{u}_p$ is a vector, $\mathbf{u}_p^H$ is a complex-conjugate transpose vector, $\mathbf{U}_p$ is a sub-matrix and H is a complex-conjugate transpose matrix.

14. (Currently Amended) The apparatus of claim 11, wherein ~~the~~ a selection of the covariance components to be removed is based on ~~the~~ a size of ~~the~~ a sliding step of ~~the~~ a signal window.

15. (Currently Amended) The apparatus of claim 11, wherein additional covariance components are determined as $\begin{pmatrix} \boldsymbol{\sigma}_f \\ \sigma_f \end{pmatrix} = \left(H(n)\left[diag\left(1-\hat{b}^2(n)\right)\right]H^H(n) + I\delta_0^2\right)\begin{pmatrix} \mathbf{0} \\ 1 \end{pmatrix}$,

wherein $\boldsymbol{\sigma}_f$ is covariance component vector, σ_f is a covariance component located

in ~~the~~ a corner of the second covariance matrix, H(n) is a system matrix in the second observation time ~~of the second covariance matrix~~, diag is a diagonal matrix, $\hat{b}(n)$ is a symbol estimate, H is a complex conjugate matrix, σ_0^2 is ~~the~~ a noise variance, and I is an interference matrix.

16. (Currently Amended) The apparatus of claim 11, wherein ~~the~~ a computation of the inverse of the sub-matrix $\overline{\Sigma}$ representing the common part of the two consecutive covariance matrices is defined with ~~the~~ an aid of determination $\overline{\Sigma}^{-1} = \overline{\mathbf{\Omega}}\overline{\mathbf{\Omega}}^H$, wherein $\overline{\mathbf{\Omega}}$ is a sub-matrix and $\overline{\mathbf{\Omega}}^H$ is a complex-conjugate transpose of the sub-matrix.

17. (Currently Amended) The apparatus of claim 11, wherein Cholesky factorisation of the inverse matrix of the second covariance matrix is defined as

$$\mathbf{W}_f = \begin{pmatrix} \overline{\mathbf{\Omega}} & -\sqrt{u_f}\overline{\mathbf{\Omega}}\overline{\mathbf{\Omega}}^H \sigma_f \\ \overline{\mathbf{0}}^H & \sqrt{u_f} \end{pmatrix} \Theta,$$

wherein $\overline{\mathbf{\Omega}}$ is a sub-matrix, $\overline{\mathbf{0}}^H$ is a zero vector, $\overline{\mathbf{\Omega}}^H$ is a complex-conjugate transpose of ~~the~~ a sub-matrix, $u_f = \left(\sigma_f - \boldsymbol{\sigma}_f^H \overline{\Omega}\overline{\Omega}^H \boldsymbol{\sigma}_f\right)$, σ_f is a covariance component, Θ is a series of unitary rotations and H is a complex-conjugate transpose matrix.

18. (Currently Amended) The apparatus of claim 11, wherein an output signal of an

equalizer is generated as $z_k(n) = \beta_k(n)\left(\alpha_k(n)\hat{b}_k(n) + \eta_k^H(n)\mathbf{W}_f^H\tilde{\mathbf{r}}(n)\right)$,

wherein $\alpha_k(n) = \eta_k^H(n)\eta_k(n)$, $\eta_k(n) = \mathbf{W}_f^H\mathbf{h}_k(n)$, $\beta_k(n) = 1 - \frac{\alpha_k(n)}{\alpha_k(n) + \left|\hat{b}_k(n)\right|^{-2}}$, $\mathbf{h}_k(n)$ is a channel response vector, n is an nth symbol, H is a complex-conjugate transpose matrix, $\hat{b}_k(n)$ is a sy mbol estimate based on a channel decoder feedback,

$\mathbf{W}_f = \begin{pmatrix} \overline{\mathbf{\Omega}} & -\sqrt{u_f}\,\overline{\mathbf{\Omega}\mathbf{\Omega}}^H\sigma_f \\ \overline{\mathbf{0}}^H & \sqrt{u_f} \end{pmatrix}\Theta$ wherein $\overline{\mathbf{\Omega}}$ is a sub-matrix, $\overline{\mathbf{0}}^H$ is a zero vector, $\overline{\mathbf{\Omega}}^H$ is a complex-conjugate transpose of ~~the~~ a sub-matrix, $u_f = \left(\sigma_f - \boldsymbol{\sigma}_f^H\overline{\Omega\Omega}^H\boldsymbol{\sigma}_f\right)$, σ_f is a covariance component, Θ is a series of unitary rotations and H is a complex-conjugate transpose matrix, $\tilde{\mathbf{r}}(n) = \mathbf{r}(n) - \mathbf{H}\hat{\mathbf{b}}$ where $\mathbf{H}_k(n)$ is a channel response matrix and n means an nth symbol.

19. (Previously Presented) The apparatus of claim 11, further comprising a second generator configured to generate the output value of the channel equalizer by further utilizing a-priori symbol estimate information.

20-23. (Cancelled)

24. (Currently Amended) An apparatus comprising:

first estimating means for estimating interference from a received signal at a first

observation time, creating a first covariance matrix on ~~the~~ a basis of the ~~estimation~~ estimating and defining an inverse matrix of the first covariance matrix and a Cholesky decomposition matrix;

removing means for removing selected covariance components from the Cholesky decomposition matrix;

computing means for computing an inverse of a sub-matrix, which represents a common part of the first covariance matrix and a second covariance matrix, which includes covariance estimates of a second observation time, by using ~~the~~ an aid of a Cholesky decomposition of the inverse matrix of the first covariance matrix;

second estimating means for estimating interference from a received signal at a second observation time and determining additional covariance components on ~~the~~ a basis of the ~~estimation~~ estimating;

creating means for creating ~~the~~ a Cholesky decomposition of an inverse matrix of the second covariance matrix by using unitary rotations; and

generating means for generating an output value of a channel equalizer by utilizing information obtained with ~~the~~ an aid of the Cholesky decomposition of the inverse matrix of the second covariance matrix.